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Study on the decreasing lipid activity of chicory root extracts and Inulin

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Key words: chicory root extracts, inulin, serum lipid indices, egg triglycerides, egg cholesterol

Introduction Chicory root extracts are important sources of inulin, chicoric acid and fructose, and have the activities of enhancing immunocompetence and decreasing cholesterol. Inulin is the main component of chicory root extracts. This study purpose was to assess and compare the effects of chicory extracts and inulin on hen's serum and egg lipid.

Materials and methods Three-hundred Nick T hens at 50 wk of age were divided randomly into five groups. Treatment groups received 0.1% (A) and 2.0% (B) chicory root extracts, 0.1% (C) and 2.0% (D) inulin in their basal diet, while the control group received only the basal diet. The experiment was carried out during 30d. At the end of experiment, 18 hens were randomly selected from each group and 3 ml of blood were withdrawn from the wing-vein of each hen. Additionally, 30 eggs were collected from each group. Total cholesterol (TC) and triglycerides (TG) concentration in serum were measured with enzyme method (Daqing Huang, 2006). Egg TC and TG concentrations were analyzed by color reaction and gravity method, respectively (Shanghai traditional Chinese medicine college, 1975).

Results Group A, B, C reduced ($P < 0.05$) serum TC and TG compared with control, group A showed the lowest serum TC and TG concentrations, with values of TC and TG 36.47% and 40.71% lower ($P < 0.01$) than control, respectively (Table 1). Similar lowering effects of serum lipid by supplementing inulin or chicory extracts into animal diet had been reported (Christine, 1999), but the lowering degree was different. This could be due to either the difference in experimental animals used, chicory variety or inulin source.

Table 1 The concentration of TC and TG in hens serum and egg (mean \pm SED).

Treatment	Serum lipid (mmol/l)		Yolk lipid (mg/g)	
	TC	TG	TC	TG
CK	5.01 \pm 0.59Aa	28.10 \pm 3.10Aa	18.91 \pm 2.03b	342.00 \pm 21.00a
A	3.24 \pm 0.35Bd	16.55 \pm 2.30Bd	20.32 \pm 2.14a	347.00 \pm 31.00a
B	4.60 \pm 0.42Ab	26.00 \pm 3.50Ab	17.85 \pm 1.16c	315.00 \pm 53.00b
C	4.22 \pm 0.29Ac	24.22 \pm 2.90Ac	19.41 \pm 2.14b	357.00 \pm 37.00a
D	4.64 \pm 0.43Ab	27.35 \pm 3.40Aa	18.14 \pm 0.78b	347.00 \pm 53.00a

Values in a column with different capital letter are extremely significant different ($P < 0.01$), with different lowercase are significant different ($P < 0.05$).

Concentrations of yolk TC and TG of group B were 5.61% and 7.89% lower ($P < 0.05$) than control, respectively. Yolk TC of group A was higher ($P < 0.05$) than control, but there was no difference ($P > 0.05$) in yolk TC and TG between groups C and D and control (Table 1). Group B had higher activity of decreasing egg lipid than group D, and that could be related to other components such as pectin, chicoric acid in chicory root extracts.

Conclusions Chicory root extracts has better decreasing lipid activity than inulin. The optimum supplementing doses for decreasing serum lipid and egg lipid were different, indicating the need for further research.

References

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